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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

TSANG FOSTER, SUSY N

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 05/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/986,459

Applicant(s)

PARK ET AL.

Examiner

Susy N Tsang-Foster

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 1/28/2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-36 and 62-64 is/are pending in the application.
- 4a) Of the above claim(s) 3,11-13,19 and 27-29 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,4-10,14-18,20-26,30-36,62 and 64 is/are rejected.
- 7) ☒ Claim(s) 63 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. This Office Action is responsive to the amendment filed on 1/28/2004. Claims 2, and 37-61 have been cancelled. Claims 4, 8, 10, and 20 have been amended. The status identifiers for claims 3, 11-13, 19, and 27-29 are incorrect since they were withdrawn in the previous office action and remain withdrawn from further consideration as being drawn to a non-elected species. It is also noted that applicant forgot to remove all underlining in claim 25 which was previously presented. Claim 63 is objected to. Claims 1, 3-36 and 62-64 are pending. Claims 1, 4-10, 14-18, 20-26, 30-36, 62, and 64 are finally rejected for reasons given in the previous office action which are reiterated below for applicant's convenience.

Information Disclosure Statement

2. The information disclosure statement filed 6/12/2003 fails to comply with 37 CFR 1.97(c) because it lacks the fee set forth in 37 CFR 1.17(p). It has been placed in the application file, but the information referred to therein has not been considered.

Specifically, applicants attached an IDS 1449 form citing Kluger (US 4,383,103) which applicant discusses in the amendment filed on 6/12/2003.

Applicant states in the amendment filed on 1/28/2004 that the fee is now being submitted and that a fresh form PTO-1449 is submitted for the Examiner's convenience. However, there is no record to date of submission of a fresh form PTO-1449 or fees submitted for the IDS to be

considered. Only applicant's amendment dated 1/28/2004 has been received since the last office action.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 4-10, 14-18, 20-26, 30-36, 62, and 64 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Maruyama et al. (US 6,420,072 B1).

Maruyama et al. disclose a rechargeable battery comprising a gel polymer electrolyte and the gel polymer electrolyte is a reaction product of a nitrogen containing monomer such as vinylpyridine and an epoxy containing material (see abstract; col. 4, lines 4-53; col. 5, lines 20-

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33; col. 5, line 54 to col. 6, line 59). The epoxy containing material can be ethylene glycol diglycidyl ether or polyethylene glycol diglycidyl ether (col. 7, lines 49-65). The amount of polymer component and the nonaqueous solvent to be used is about 100 to 5000 parts by weight of the latter per 100 parts by weight of the former and wherein the electrolyte (salt) exists as dissolved in the nonaqueous solvent (col. 4, lines 4-16). This means that the weight percentage of the polymer component ranges from $100/200 \times 100\%$ by weight (or 50 wt%) to $100/5100 \times 100\%$ by weight (or 2 wt%). Thus the range of polymer is 2 wt% to 50wt % based on the total weight of the gel polymer electrolyte. Conversely, the liquid electrolyte would be present from 50wt% to 98 wt% based on the total weight of the gel polymer electrolyte. The electrolyte can be LiClO_4 , LiBF_4 , LiPF_6 , LiAsF_6 , LiCF_3SO_3 (col. 3, lines 45-50). The concentration of the electrolyte in the nonaqueous solvent is about 0.1 to 3 M (col. 9, lines 40-44) which overlaps with the claimed range of 0.5 to 2 M.

Since the weight percentage of liquid electrolyte, the weight percentage of polymer, and the concentration of the electrolyte in the polymer gel electrolyte all overlap with the claimed ranges, the polymer gel electrolyte inherently would have an ionic conductivity of between about 1×10^{-3} to about 1×10^{-2} S/cm. As further evidenced by the specific examples given in Tables 2, 9, 10, and 11 of the reference, the polymer gel electrolyte using crosslinked polymers containing nitrogen besides vinylpyridine have ionic conductivities of between 1×10^{-3} to about 1×10^{-2} S/cm.

A nonwoven fabric of polyolefin of 25 micron thickness which is microporous can be used as a support for the gel (col. 14, lines 39-67 and col. 31, lines 8-35).

It is noted that applicants state on page 9, line 28 to page 10, line 1 of the specification that the nitrogen group in the gel polymer electrolyte serves to increase the cell voltage before the cell is actually charged. Thus, the rechargeable lithium batteries using this gel electrolyte of Maruyama et al. would inherently have a pre-charge voltage of at least about 0.3 V or greater due to the presence of the nitrogen group in the polymer electrolyte.

The court has held that claiming of a property or characteristic which is inherently present in the prior art does not necessarily make the claim patentable. In re Best, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977). See also MPEP 2112 and 2112.01. When the Examiner has provided a sound basis for believing that the products of the applicant and the prior art are the same, the burden of proof is shifted to the applicant to prove that the product shown in the prior art does not possess the characteristics of the claimed product. In re Spada, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

Allowable Subject Matter

6. Claim 63 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. The following is a statement of reasons for the indication of allowable subject matter:

The closest prior art of record, Maruyama et al., does not disclose, teach, or suggest that the nitrogen containing polymer is poly(2-vinyl-pyridine-co-styrene) in the gel electrolyte.

Response to Arguments

8. Applicant's arguments filed 1/28/2004 have been fully considered but they are not persuasive.

With respect to applicant's arguments that the amine or nitrogen containing cationic function (protonated amine) in Maruyama et al. is simply just a chemical group attached to the vinyl compound and that the cross-linking reaction to form a gel thus occurs by the vinyl groups or by virtue of hydroxy groups with diisocyanate and that in direct contrast, in accordance with the present invention, the pyridine containing polymer reacts with the epoxy unit to form the cross-linked gel structure such that the nitrogen in the pyridine reacts with the epoxy compound so as to convert it to a N-oxide structure and thereby cross-link the polymer chains.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., a N-oxide structure which cross-link the polymer chains of the resulting gelled polymer) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Specifically, the N-oxide structure of the resulting gelled polymer are irrelevant to the rejected claims which do not claim the N-oxide structure. Applicant's arguments are only relevant for claim 63 which specifically claims the gel polymer electrolyte as the reaction

product of poly(2-vinyl pyridine-co-styrene) and butanediol diglycidyl ether which has been indicated as being allowable in the previous office action and which according to applicant's arguments would form an N-oxide structure.

Nevertheless, the Examiner disagrees with applicant's arguments regarding the mechanism of reaction in the reference because the two monomers, vinylpyridine and ethylene glycol diglycidyl ether disclosed in the reference are the same monomers claimed by applicant in the claims (see instant claim 62 which recites a vinylpyridine compound and instant claim 30 which recites that the epoxy-group containing material may be ethylene glycol diglycidyl ether) and therefore the resulting reaction product of these monomers in the reference must be identical to the claimed reaction product resulting from these two monomers. Thus, the reference discloses all the claimed limitations of the rejected claims (note claim 63 is not rejected by Marayuma et al).

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications should be directed to examiner Susy Tsang-Foster, Ph.D. whose telephone number is (571) 272-1293. The examiner can normally be reached on Monday through Friday from 9:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached at (571) 272-1292.

The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

st/ *Susy Tsang-Foster*

Susy Tsang-Foster
Primary Examiner
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